

Listing of Claims:

Claims 1 - 56 (Canceled).

57. [Amended] A device for eliminating an arrhythmogenic focus in a pulmonary vein comprising:

a heating element capable of maintaining a temperature in the range of about 38° C to 48° C over a time period range of about 5 to 60 minutes, said temperature range and time period under those that would induce tissue scarring, blood-clotting or myocyte injury; [and,] at least one detector capable of detecting the presence or absence of an arrhythmogenic focus comprising atrial myocytes; and at an electrical connection from said heating element to said detector capable of regulating the temperature of the heating element in response to arrhythmogenic activity at said focus.

58. The device of claim 57, wherein said detector electrically detects the presence of said atrial myocytes by their ectopic electronic emissions.

59. The device of claim 57, wherein said detector detects the presence of said atrial myocytes using positron emission tomography.

60. The device of claim 59, wherein said detector tracks differential uptake of a radio-contrast agent by said atrial myocytes using positron emission tomography.

61. The device of claim 57, wherein said detector is capable of thermogenically detecting the presence of said atrial myocytes.

62. The device of claim 57, wherein said detector is capable of monitoring apoptosis of said atrial myocytes.

63. The device of claim 57, wherein said detector is capable of both detecting the presence of atrial myocytes and of monitoring the removal of said atrial myocytes.